The Northwestern MILLER
MILLING PRODUCTION SECTION

Radiation Processing of Foods

By Dr. Joseph Silverman

The radiation processing of foods is a topic which has fired the popular imagination. However, the picture which is emerging from the press, television and radio is somewhat confused. On the one hand, the public is told of the preservative effect of atomic radiation, and on the other hand, there are dire warnings about the bad tastes, bad odors and discolorations associated with radiation processing. As for the cost picture, the general impression is that the technique is not now commercially practical, but that it will be in the near future.

Press information on scientific projects in general, and radiation food processing in particular, is usually neither accurate nor complete. This is not due to incompetence; it arises from the attempt to provide timely news. Thus, reporters have often taken current progress reports containing preliminary unsubstantiated data and presented them in an undigested uncritical manner.

The silence of the Food and Drug Administration has not helped matters any. Also, several research scientists in the limelight of flattering interviews have made some unfortunate remarks.

One must recognize that until very recently all the data in this field were on the test tube level. Furthermore, very few people involved in these important basic studies were experts in the economies and practical engineering aspects of food processing. Consequently, we had a situation in which research data was extrapolated to the plant scale by amateur food technologists.

In the last six months there has been a sharp increase of industrial interest and activity in the field. The practical side of radiation processing has been given a good deal of attention, the role of the government regulatory agencies has come under consideration, and the cost and availability of sources of atomic radiation have been more carefully analyzed. As a result, we have finally reached the stage where we can make some authoritative statements about the future of radiation in food technology.

Two Basic Areas

There are two basic areas of potential application for radiation processing: (1) permanent preservation and (2) storage life extension.

Permanent preservation of several foods has been accomplished by treating them with sterilizing doses of atomic radiation. In order to be competitive in normal consumer markets, a radiation sterilized product will have to conform to the same high standards of consumer appeal, nutritive value and storage life as other commercial offerings. In addition, radiation must do the same job as heat sterilization at a lower cost, or a better job at only slightly higher cost.

At present, no radiation-sterilized food has been found which meets all these standards. Almost all radiation-sterilized products are lacking in consumer appeal. Objectionable changes in flavor, odor and appearance are generally observed in irradiated fresh products, canned products and the concentrated varieties. Furthermore, radiation sterilization is often accompanied by decreases in micronutrient concentration. The dose required for sterilization is 2 to 3 million roentgen. This is enough to break about .005% of the chemical bonds so that small, but significant, chemical changes are not unexpected.

Several methods have been proposed to reduce these undesirable chemical effects, such as the addition of protective agents and combined heat and radiation treatments. These techniques are limited in utility, but they may yet save a few important food irradiation processes.

As far as storage life is concerned, most radiation sterilized foods leave something to be desired. Sterilizing doses are not always sufficient to inactivate enzyme systems. Consequently, several radiation sterilized foods decay rapidly. Here again, a combined heat and radiation process may prove to be acceptable.

Radiation Costs

What about cost? Several estimates have been offered, but they will continue to be little more than guesswork until radiation is used widely enough for charges to become stabilized.

At present, electron beam generators are the only reasonable sources of radiation. The sterilization cost with the present machines runs about 5 to 8¢ per pound. Although this cost is prohibitive, notable advances in the design of linear accelerators indicate that it will probably go below 1¢ per pound.

Radioactive isotope sources have been limited to relatively small laboratory units. However, considerable quantities of Cobalt-60 and Cesium 137 will be available in the next four to five years in forms suitable for use in commercial food irradiators. Since the Atomic Energy Commission will largely determine the pricing and distribution policy for these sources, realistic appraisal of the economic factors must wait until this policy is set forth. My own opinion is that the cost of gamma sterilization will eventually be competitive with electron methods. Both methods, however, will be more expensive than the heat sterilization processes now in use. The cost of heat sterilization is about .1¢ per pound.

Not Encouraging at Present

All in all, the prospects for radiation sterilization of food for the normal consumer market are not encouraging at present. However, it is noteworthy that several processors in the meat industry have not given up hope.

Application to the military field is much more promising. The defense establishment may accept foods lower in quality from the standpoints of taste, odor and appearance so long as they satisfy nutritional standards and fulfill logistic requirements. Thus, if radiation sterilization can markedly reduce field problems of refrigeration and storage, it might be justified despite other limitations.

The key to the problem is the wholesomeness and nutritive value of radiation sterilized food. The Army Quartermaster Corps Food & Container Institute and the Surgeon General's Office are currently examining this problem in great detail. Thus far, radiation sterilized food has not produced any deleterious effects in animals or humans. However, the tests are in their earliest stages and the long-term effects are still unknown.

The second major area of application is the use of radiation in relatively low doses for the limited extension of storage life of various commodities. Thus, a few thousand to 100,000 roentgen have produced the following list of accomplishments:

1. De-infestation of grain. Cake flours prepared from radiation de-infested grain have been shown to be of excellent quality.

2. Fresh fruits, vegetables, dairy and bakery products have shown remarkable increases in shelf-life after low-dose surface pasteurization.

3. Irradiated potatoes have exhibited excellent appearance and taste after two years of storage. Sprouting was completely inhibited. Onions sprout slightly after radiation, but not to the same extent as non-irradiated onions.

EDITOR'S NOTE: The author of the accompanying article, Dr. Joseph Silverman, is technical director of Radiation Applications, Inc., New York. He previously was research department head of Walter Kidde Nuclear Laboratories, Garden City, N.Y., and staff physical chemist with the atomic energy division of The H. K. Ferguson Co., New York. This article is the text of a talk presented by Dr. Silverman at a meeting of the New York Section of the American Association of Cereal Chemists.

4. Irradiated pre-cut and pre-packaged meats showed as much as a twenty-fold increase in shelf-life.

More Favorable Picture

Although not as extensively publicized as the sterilization application, the advances in the area of low-dose application are very encouraging. Costwise, it presents a much more favorable picture. Even more important is the fact that the lower doses involved cause much smaller changes in product quality. This area is the one to watch for in the first commercial development.

Major interest is currently focused on two radiation processes—de-infestation of grain and inhibition of sprouting in potatoes.

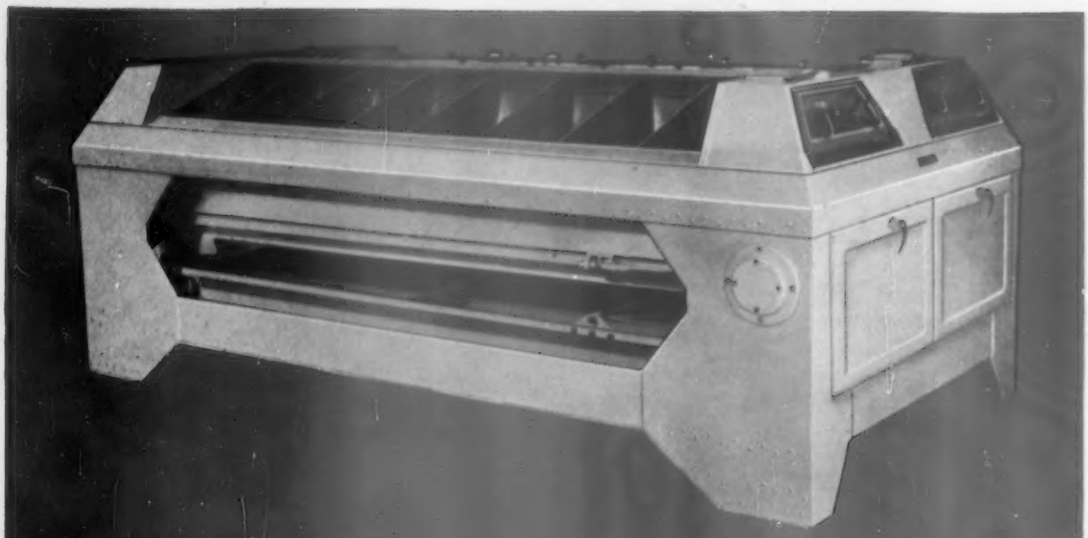
The immediate attraction to the businessman is the fact that for this type of treatment, radiation appears to enjoy a special position.

Another important feature is the low doses required—about 10,000 roentgen. Our food experts believe that at this dose level, irradiated grains and potatoes will probably be indistinguishable from the fresh unirradiated product, either by sensory tests or ordinary analytical methods. The low dose also means low radiation costs. Using current electron economics, such doses can be delivered at .04¢ per pound (This assumes the cost of two million rep is 8¢ per pound; the latter assumption holds for very large volume processing rates); five years from now they should cost, perhaps, one-tenth as much. However, even if prevailing electron beam costs were to be acceptable, the available machines would still be unsuited for these processes. Their beams have poor penetration properties (less than one inch) and are confined to a small area. Therefore, to treat commercial volumes, thin layers of the target food would have to be conveyed past the beam at tremendous speeds.

Industrial Operations

Encouraged by the prospects in the field of low-dose treatment, the American Machine & Foundry Co., assisted

(Continued on page 17a)



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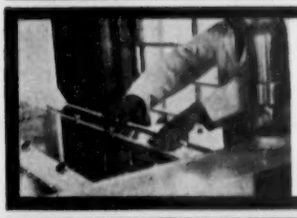

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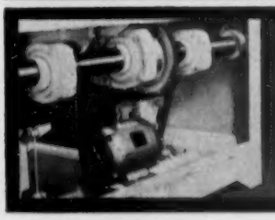

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Careers in Cereal Chemistry

• • •

By Dr. C. H. Bailey

The best criterion of the prospects of a successful career in any profession is the level of attainment of those who have been active in that field. When one observes the present status of cereal chemists who have been serving as such for a score or more of years, it is apparent that they have played a major role in the progress and development of a great industry; also, that they have enjoyed material rewards and have, in many cases, been advanced into positions of major responsibility.

Of course much depends upon one's standards in measuring success in a career. Fortunately for the society in which we live, a substantial proportion of our scientifically trained contemporaries find the greatest satisfactions of service in a setting which primarily provides opportunity for exercising their knowledge and technical skills to the utmost. I suspect that most of us set a higher value on being recognized for a contribution to some phase of professional activity than merely adding some dollars to our bank account.

It is to those youths whose philosophy of life follows such a general pattern that a discussion of careers in cereal chemistry can profitably be directed. I'll grant that they naturally desire some assurance of respectable living, and here the experience of our generation gives reasonable assurance of that prospect as well. Accordingly we need have no fear of misdirecting or abusing the youth of today if we guide their college training along channels that will qualify them for the specialization that we have followed.

This leads, then, to a consideration of the manner in which the American Association of Cereal Chemists, its committees, local sections and individual members may usefully proceed in counseling students in these regards. In developing such a program, or programs, we shall do well to recognize that we are moving into a highly competitive area. For many specializations are reacting in like manner, and are devising various ingenious schemes to attract students into qualifying in these fields. If you doubt this, look at all the printed material, published by various institutions, societies and corporations to advise students concerning certain professional specializations. Certain of these, for example, are entitled "Careers in Dairy Science," "So You Are Going to Be an Engineer," "Veterinary Medicine As A Career," "Opportunities in Forestry," "Home Economics," "Career as a Food Chemist," "Some Objectives in Preparing College Men for Industry" (written by an International Harvester Co. consultant), and a 50-page bulletin published by the Government Printing Office entitled "The Outlook for Women as X-ray Technicians." These are just a few of many such documents that have been collected in recent months; there are many more in my collection, and doubtless scores of others that have not been secured as yet.

The occasion for such an outturn of career literature is suggested by an item published recently in Business Week. This mentions that at a recent conference of engineers, grave concern was expressed over the fact that U.S. colleges in 1954 graduated only 20,000 with engineering training, as compared with 54,000 in Soviet Russia. Consequently the conferees recommended extended draft deferment, more state and government scholarships, a wider pay spread between trained scientists and less-trained workers, and the bringing of more women into the engineering field.

Note that if the technics mentioned are to function in shifting the interests of more students to engineering curricula, it inevitably follows that the students will be recruited from the same population that would normally supply students of food technology and other physical sciences. For the type of mind that can qualify for important assignments in engineering is the same type that is adapted to the professional area with which those present here today are concerned. To supplement these facilities there has recently been published the Engineers Job Directory,

EDITOR'S NOTE: Competition among industries for technically trained personnel is constantly increasing, and this problem applies to the milling and grain industries as well as other industries. For that reason, mill management as well as persons in technical positions in the industry will be interested in the accompanying article by Dr. C. H. Bailey, dean emeritus of the University of Minnesota School of Agriculture. This article is reprinted from the AACC Transactions, published by the American Association of Cereal Chemists, and it is the text of a talk by Dr. Bailey at the AACC's 1955 meeting.

Machinery Executive Sees Progress Made In Building by South American Millers

Probably no where in the world have new mills been erected in such numbers in recent years as in South America. All the major milling machinery firms have secured contracts either for construction from the ground up or for remodels. Among them is the British milling machinery firm of Thomas Robinson & Son, Ltd., Rochdale, and the firm's joint managing director, C. Salkeld Robinson, recently spent two months inspecting developments in Brazil, Chile and Argentina.

Mr. Robinson's first stop was at the show place of the milling world, the new plant of the Anaconda Industrial e Agricola de Cereais S.A. at Sao Paulo. He was accompanied by J. J. Schefer, Robinson resident representative in South America and Sr.M. Almeida, an official of the company which has acted for Robinson in Brazil for many years.

There to show Mr. Robinson over the new mill was Henry Donovan, managing director of Anaconda. Mr. Donovan expressed himself as very satisfied with the mill and with the "Pneu-Flow" system installed. The diagram has proved itself to be as flexible as he desired.

Recalling his chief impressions of the mill, Mr. Robinson said two things stood out in his mind. One was walking straight into the main roller floor which is at ground level. This is made possible by the "Pneu-Flow" system of elevating stocks vertically from the rollermill hoppers. A basement is thus not required and this means a considerable reduction in building costs. Mr. Robinson's second impression concerns the remarkable ease with which the whole mill can be started and stopped. Owing to a power shortage in Sao Paulo, the electricity supply is cut off without any warning during each afternoon. When this happens the whole plant comes slowly to a halt without any trouble and the rolls are automatically parted by their "Rollomatic" mechanism.

Mr. Robinson commented: "Contrast this orderly stoppage with the difficulties that would be caused by a power failure in a mill fitted with mechanical elevators."

After two hours, the current is restored and the machines, nearly all of which are fitted with independent motors, are started up in sequence, again without difficulty or the slightest sign of a choke.

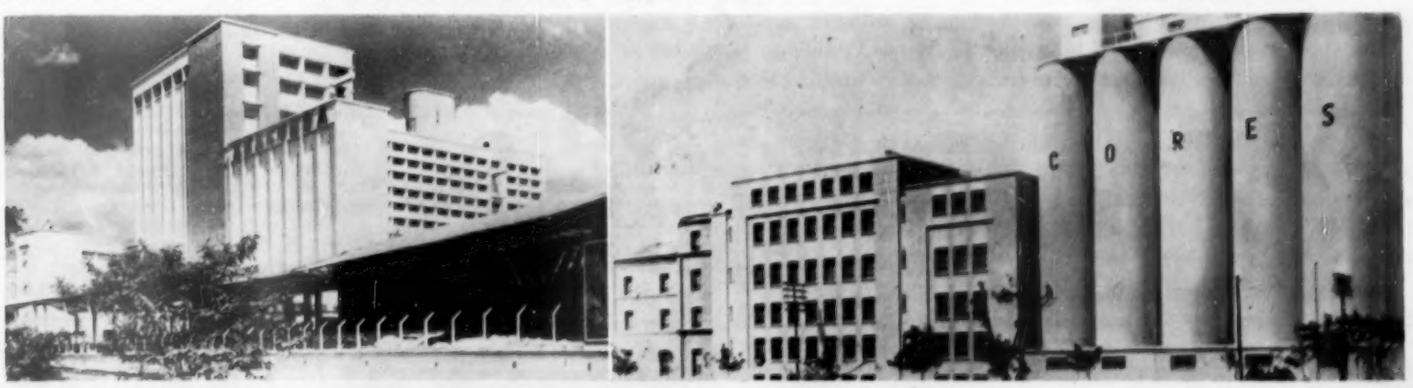
Sao Paulo, in common with other Brazilian cities, has expanded at an enormous rate in recent years and Mr. Robinson says that it is now unrecognizable to someone like himself who has not visited it since before World War II.

Revolution Cuts Program

The next stop on the tour was Rio de Janeiro where Mr. Robinson met officials of some of the larger flour mills. Two days before he was due to fly to Argentina he received a cable from Buenos Aires saying that the weather was good. This was a pre-arranged reference to the political climate. But, Mr. Robinson, comments, the weather forecast proved inaccurate for on the next day a revolution broke out. This compelled a change of plan and he proceeded to Chile. He met for the first time the directors of S.A.C. Saavedra Benard, Robinson representatives in Chile.

The postponed visit to Argentina then took place, though the revolution forced him to curtail his activities. He was met by Edward Lister of R. A. Lister & Cia, Ltda., from whom he learned details of the situation.

Mr. Robinson visited the Francisco Cores, Ltda. mill at Mercedes which is being built on the latest lines with a complete "Pneu-Flow" conveying system. It is hoped to start-up this mill early in 1956. But it was not all new construction that Mr. Robinson saw. About 20 years ago the Robinson engineers planned and erected a mill at La Plata for Miguel Campodonico, Ltda. and he found it to be as good as new. The credit, he says, is due not only to his own firm as the builder, but to the owners for the careful way in which it has been operated since. Also on the list for visits was the firm of Borgonovo and Badino, a Robinson customer for many years, and Molinos de la Plata, Ltda., whose directors he said were very helpful. Through the good offices of Dr. Ovidio Gimenez, president of the Argentine Millers' Assn., he was able to meet a group of prominent millers at their first meeting following the revolution.



SOUTH AMERICAN MILLS—The new mill built by Thomas Robinson & Son, Ltd., the British milling engineers, for Anacconda Industrial e Agricola de Cereais S.A. in Brazil, is shown in the picture at the left. Located at Sao Paulo, the mill is serving a rapidly growing area. On the right is a picture of the mill of Francisco Cores, Ltda., at Mercedes, Argentina. This mill is now being erected by Robinson and the start-up is expected in the near future.

which lists the principal employing companies, thus providing the prospective engineering student with added conviction that here is a field in which a good job with a strong firm is assured.

Among these documents is a very attractive one published by Kansas State College, entitled "Prepare for A Career in Milling." This covers, to be sure, not only the offerings in cereal chemistry education, but in milling, feed technology, and mill administration, in all of which areas that college is well equipped to give instruction.

Thus it is evident that numerous specializations are exceedingly and effectively active in recruiting students. It becomes necessary for other professional areas, such as our own, to insure that we are not overlooked by those students who are making a sincere and conscientious effort to plan professional educational programs.

Doubtless the first effective move in the direction of assisting such students is to provide them with convenient and readable literature that they may study at their leisure. Such literature, in the form of leaflets or brochures, must cover two major areas in order to receive serious consideration: 1) What are the opportunities? and 2) How does one prepare oneself, or, in other words, what specific education and training is indicated, and how can it be had? The preparation of such literature merits careful thought, and doubtless will require some experimental development at the hands of skilled educational psychologists. In a practical way, its cost must be kept within reasonable bounds, and especially if the expense of publication and distribution is to be borne by an association designed to function primarily in other capacities. At the same time, these leaflets must be attractively written and illustrated with photographs or drawings that show specialists at their tasks. Certain of these engineering and forestry course announcements that I have mentioned illustrate what I have in mind.

Once printed, such informational literature must be directed through appropriate channels that will bring it into the hands of interested students. It is suggested that the several sections of this association might become effectively active in this connection. Through appropriate committees, these sections could establish contact with faculty counselors in high schools and colleges who, in turn, could place printed material in the hands of those students who exhibit an interest in training for a career in science.

Also the members of such committees might be afforded opportunity to actually appear and speak before science clubs in educational institutions in the area covered by the section. Thus they may not only kindle interest in the students who are present but, if the task is skillfully performed, may also stimulate added interest on the part of the faculty who serve as advisors. This may spread the committees' efforts over more than the one generation of students that is present at the time of initial contact. Some pictures or lantern slides that can be displayed in connection with talks and conferences may add greatly to the effectiveness of such efforts. I note, for example, that the National Committee for Careers in Medical Technology has produced a 24-minute color sound film entitled "Career: Medical Technologists" that is being projected before appropriate groups about the country at this time.

Speaking of competition, another factor in the present situation is the growing demand for the services of teachers of science in secondary schools and colleges. There is a drive under way now to attract students into the teaching field, which may have a considerable effect upon the relative availability of prospects for other science fields.

Scholarships

Another procedure that is becoming increasingly common is to offer scholarships to either undergraduate or graduate students. Such scholarships range in value from a few dollars, or the equivalent of tuition, up to the level of the actual cost of living, the latter being most common at the graduate level. Now some of us may say that such generous treatment was not accorded us or our contemporaries when we were college students. But here again, it becomes a matter of sheer competition and the changing trend of the times. When other industries are thus attracting superior students into a program of education in their field of specialization, we must pause and give thought to the issue of its effect upon us. It may be cheaper in the long run to compete through the medium of undergraduate fellowships, with the provision that the recipient must pursue a stipulated line of education, when avoiding such expense means a dearth of superior and well-trained graduates.

In the February 7, 1955, issue of Chemical & Engineering News there appeared an announcement that Gen-

Here's why COLD WEATHER FUMIGATION can be effective

There've always been several basic misconceptions about insect infestation during cold weather; also about cold-weather grain fumigant effectiveness.

It's frequently said: *(1) that grain insects become dormant or inactive in cold weather; (2) that, since the insects are dormant, they become resistant to fumigants; (3) that there's therefore little use in fumigating grain in cold weather.*

The trouble with the foregoing reasoning is that it begins with faulty assumptions and ends with false conclusions.

In the first place, the insects live in the grain. Hence their "weather" is the grain temperature. Cold weather has little to do with the internal temperatures of sizable bins of grain *unless* the grain is transferred.

Second, if infested grain is neither treated nor transferred, the insects are a worse threat in cold weather than in mild weather. Cold weather drives insects inward in an undisturbed grain mass. The insects instinctively "bunch". They thus create worse spot heating than in warm weather, often causing serious moisture condensation on adjacent surface grain.

Third, with their tendency to "bunch" and create warmth, insects don't become dormant in grain unless the grain temperature is below 60° F. *And how much grain have you ever had to treat in that temperature range?*

Fourth, while it's theoretically true that insects show increasing resistance to fumigant action as grain temperature is lowered, this isn't actually true—*not within the grain temperature range at which nearly all grain is fumigated.*

Fifth, it's actually the other way 'round. All fumigants are severely handicapped by high grain temperatures *accompanied by heating or poor grain condition* because such factors impede proper gas penetration, diffusion and sorption. But, with lower temperatures and proper grain condition, all fumigants benefit by more efficient action and increased sorption.

Below 70° F. the efficiency of fumigants containing slow-volatility compounds is supposedly lowered because of delayed vaporization. But the more effective and versatile liquid fumigants show increasing effectiveness down to a grain temperature of around 60° F.

Hence, don't be misled by the common cold-weather bogey about insect dormancy and fumigant ineffectiveness. More important, don't let it lull you into neglecting your grain. Infestation in untransferred grain is much more dangerous in cold weather. Don't be concerned whether your grain is too cool for effective treating. (It won't be.) Worry about whether it's too warm. If it is, run it and condition it. You can then fumigate effectively.

The above facts and conclusions have long been common knowledge to most elevator men having the widest experience in handling and treating large volumes of grain. The Weevil-Cide Company was merely the first to recognize, publicize and correlate the observed facts with the supporting technical background.

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eral Motors was about to provide $2 million for four-year scholarships, which will be increased in its fourth year of operation to $4.5 million. Union Carbide and Chemical is supplementing its grants to a degree that will provide a total of 376 fellowships next year.

Ah, but—you may ask—does not the provision of such scholarships by an industry or a corporation imply guaranteeing the recipient a position at the time of graduation? I'll agree that in a free economy such as ours, no guarantees of that nature can normally be made. As a matter of fact, however, a curriculum can be programmed that will qualify the registrant for a relatively wide range of vocations upon graduation. Thus, if exactly the desired position is not immediately available, the graduate can still fit into some other assignment calling for identical basic training. For the moment such discussion is more or less academic anyway, since the situation which provokes this very consideration of the topic in itself points to a need for more trained personnel than appears to be available at this time.

Reference has been made to the detail of inspiring more interest in cereal chemistry careers in the minds of instructors who serve as student counselors. Is it not conceivable that this process might be facilitated by actually employing some of these instructors as analysts and technicians in cereal laboratories during the summer vacation season? That might develop to the advantage of both the instructor, who thus supplements his annual income, and the employing laboratory, which can thus secure competent assistance during what is often the rush period of the harvest season. Certainly any instructor thus employed will have added respect for, and hence interest in, the specialization with which he has acquired direct familiarity, and will be apt to feature that interest in discussing careers with professionally minded students with whom he has contact.

Summer Work

A related technic has been employed by certain industries in recruiting college students. Instead of waiting until students are about to graduate before interviewing them concerning employment, several firms have employed likely candidates during the summer recess from June through September, between the junior and senior years. When, as commonly happens, the students thus employed presently indicate an interest in a full-time position following graduation, such students can be registered at the beginning of their senior year in those courses offered by their college that will most directly and effectively qualify them for their projected specialization. This is to the advantage of the student, who thus points himself for a specific undertaking, and of the firm, which secures the services of more highly qualified personnel. Incidentally, it should be emphasized in this general connection that a skilled faculty can identify superior students at the end of the third or junior year of an undergraduate course as well as at the time of graduation.

In this brief survey I have attempted to analyze certain general and specific aspects of the interests and responsibilities of an industry in predisposing high school and college students to a career in that industry; of the changing attitudes and practices of the several agencies involved in attracting candidates to and training them for specialized careers, and, I trust, of the increasingly intense competition among schools, colleges, reesarch institutes, and industrial units for the services of competent and well-trained personnel.

It appears to me that any major industry which does not alert itself to these forces, and then develop vigorously active procedures in harmony with the times, will either have to be content with less competent technicians and scientific staff or find itself short-handed. With adequate interest and support from management, it may well become a major responsibility of the present scientific staffs of the industries, and hence of their professional associations and societies, to put into motion and maintain the detailed processes of interesting students in careers, and in advising concerning the procedures to that end. Team work in this connection should be most effective, no doubt, but even good team play requires intelligent thought and the best energies of every member of the team.

—BREAD IS THE STAFF OF LIFE—

Du Pont Education Aid Is $900,000

WILMINGTON, DEL. — A fund of more than $900,000 has been allocated by E. I. duPont de Nemours & Co., Inc., for grants to universities and colleges in the company's annual program of aid to education. The announcement was made by the firm recently. More than 100 educational institutions will be included in the program which is for the next academic year. The amount involved is a substantial increase over the $800,000 in gifts made for the present year.

The company states that all of the increase and nearly half of the entire new program are for the improvement of teaching in colleges, universities and in high schools. The grants will support science and mathematics as well as other subjects.

The growth as well as the change in emphasis in the company's effort reflects the changing needs of the schools. At the same time, grants for fellowships in science, which once made up the entire program, and for fundamental research are being continued, the company states.

Du Pont has also expanded its grants for postgraduate teaching assistantships to $115,000. There are 30 of these grants, mostly in chemistry, and they are shared by 28 universities. Purpose is to improve instruction in the universities and to encourage postgraduate students to enter teaching careers.

Under its longer standing plans, the company is granting $270,000 to universities for fundamental research and $190,000 for postgraduate fellowships in science and engineering.

—BREAD IS THE STAFF OF LIFE—

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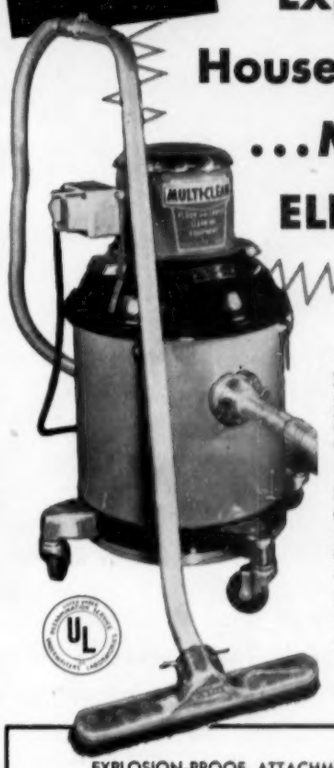

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Manpower Management

• • •

By J. S. Blunt

EDITOR'S NOTE: The progress of any company or industry may depend in large measure on the development of company leaders who have the know-how to do a really effective job of directing personnel. For this reason, many millers will be interested in the accompanying article on "Manpower Management" by J. S. Blunt, southern division production manager for the Ralston Purina Co., Ft. Worth. The article is the text of a talk at a meeting of the North Carolina Feed Manufacturers Assn. Mr. Blunt's remarks were addressed to feed manufacturers but apply equally to other industries.

Generally speaking, in most businesses, if you solve your manpower problems, you do not have many other problems. For that reason industry today is spending more time and money in personnel work than ever before.

Basically good manpower management and the proper direction of personnel mean several things:

● Selecting the right man for the job—for each and every job. (The requirements are different for each job.)

● Training the man selected to do the job right, to do it efficiently, and to do it the way you want it done.

● Supervising these men you have selected and trained in their daily work in a way that will get the job done to the best of each man's ability.

● Developing a spirit in the working group, a morale, a "spirit of want to."

● Being sure both your supervisors and your men have a full picture and understanding of the job to be done; they should have the training and the knowledge of how you want it done and really understand the final end to be accomplished.

● Delegation of responsibility and authority in a manner that will assure satisfactory and efficient results.

● Having a pay scale that will attract quality workers—a fair day's pay for a fair day's work. (Incentive to produce).

Basically all of these points are tied together as the principles that must be put into effect to obtain results. Let's consider them one at a time.

Selecting the right man for each job to be done. This means selecting the right man for each supervisory job, for each office job and for each job in your plant.

To do this intelligently requires a job study. You need to know the different physical requirements of each job needed for efficiency. Is any special dexterity required?

What special skills are needed? Some jobs require skills that can be obtained by experience only (e.g., bricklayer, carpenter, millwright, some machine operators); some require special training like the more complicated operations in your plant; others require only muscle.

What mentality is needed? Just horse sense? Good judgment? Constant thinking? What decisions must he make?

What education does the job require? Reading? Writing? Arithmetic? Or is higher education essential to do the job you have in mind?

After you have finished your job study and know what sort of a man the job requires, the next problem is how do you find out which man will fill the bill?

System of Selection

You need a system of selection, a way of finding out which men can meet your job requirements.

First and most widely used are, of course, personal interviews. How good a judge of men are you? Do you believe in phrenology, physiognomy, astrology, etc.? Do you believe that if a man's eyes are close together he is narrow minded, that a receding chin means a "Casper Milk Toast?"

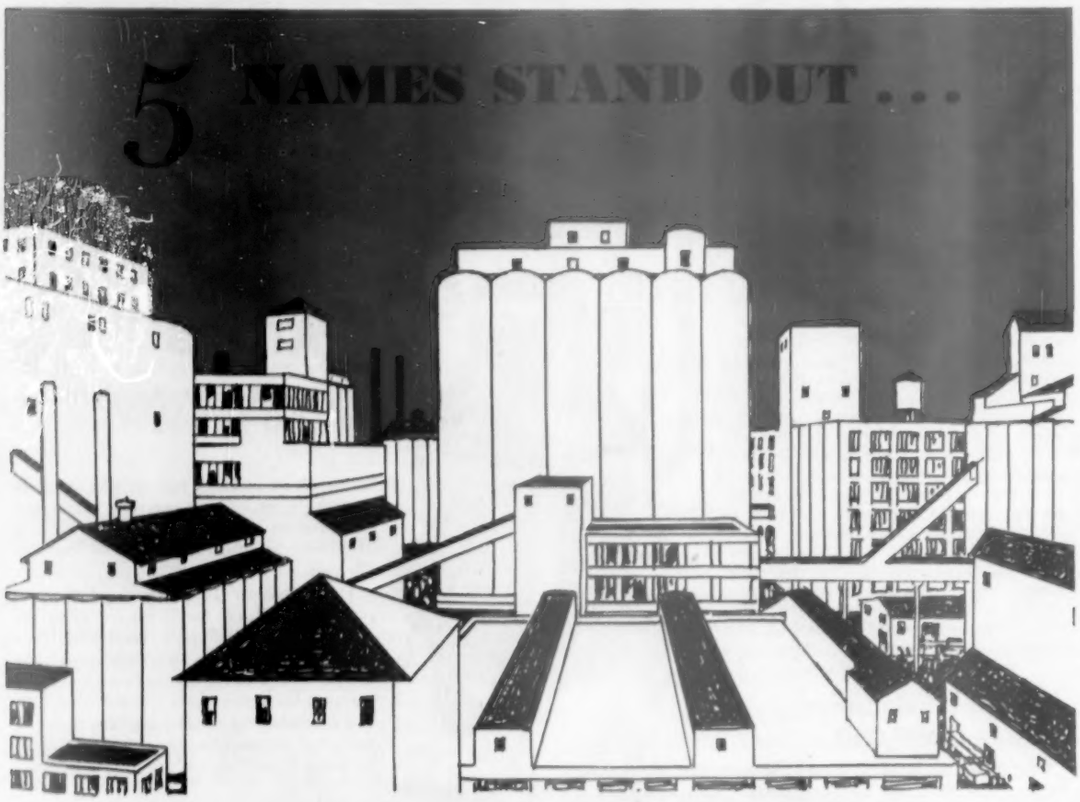
Most of the old fashioned ideas have been proven false. At least they are not right often enough for us to depend upon them in the selection of men.

In a personal interview you can learn a man's mannerisms, maybe something of his personality. Is he an introvert or an extrovert?

You can supplement the information he gives you on his application blank or information blank regarding his life history, details of his education, family status and so on. That is about all.

Then, you can give tests. Numerous tests have been devised to tell you still more of a man's abilities.

The AGCT test — the old Army I.Q. test—will give you a general measure of a man's native intelli-



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gence. With experience you can set a standard I.Q. figure required for each job. But this only gets to the basic mental requirements, below which your chance of proper selection is very poor.

Clerical ability for office workers can be determined by several tests, such as the Minnesota Clerical, the Otis, the Pressey.

Mechanical ability can pretty well be determined by one or two mechanical comprehension tests.

All of these will tell you still more about the man you contemplate hiring for the job you have in mind. How far to go in this search for ability, of course, depends upon the importance you attach to the job to be done.

In your interview you can show the man the job to be done. Study his reactions as you show him. Does he seem to have confidence in his own ability to do the job? Can he sell you that he is your man?

Once your applicant does satisfy you that he is the man for your job, you are ready for the second step in manpower management—training.

Training the man for the job. Do you have an employee training program in your business? If not, how do you, your foremen or your office manager start a new man off in the plant? Do you give him a hand truck and tell him to go to work? Tell him to help load that truck, unload that corn or some such job, then let him find out how the job should be done, where things are, etc., the hard way?

Or, does someone explain the job to him fully? (You or one of your supervisors, in the case of a plant or office worker).

Does someone make sure that he understands thoroughly his part of the over-all job to be done? Every worker should know what is to be accomplished. He should know where he fits into the organization. Once this is done, his team work will be better; he will feel more as though he is really on the team.

Early in this training program, plant rules and important company policies should be explained to the new worker. This can be done at the same time you are telling him about your compensation plan, hours of work, assigning clock number and locker number, and the other numerous details necessary when you add a man to the payroll these days.

Once the details are taken care of, the immediate foreman or department head should:

(1) Introduce the new employee to other members of the department, to his co-workers.

(2) The foreman should show the man where things are—the locker rooms, lunch rooms, working tools and equipment. Explain plant rules and privileges — smoking rules, attendance requirements, etc.

(3) Explain the job to be done, how it should be done, and its relationship to the entire operation. Some plants ask an older worker to take a new young man under his wing to help him with day-by-day and hour-by-hour problems. He can show the new man just how you want a job done, show him several times if necessary for him to learn it. At any rate, some one should show him how to do his job, let him do it himself, then correct him until he is doing it satisfactorily.

(4) No matter how this is done, follow-up by the supervisor is essential. At the end of the first and second weeks, the personnel manager, the superintendent or you — depending upon your organization—should check with the new employee and the immediate foreman to determine job adjustment and progress.

After 30 and 60 days, the immediate foreman should complete a progress report on the new employee for you. Any problem, or outstanding progress should be discussed.

More involved work requires probably more instruction and more follow-up on the part of management.

This is the bare minimum of job instruction and is a start towards good supervision.

Good supervision. Good supervision is basically just effective direction of personnel, and is essential to protect your firm's interest, to obtain satisfactory work, to maintain morale and keep labor troubles at a minimum. It will also keep your costs down.

Effective personnel direction can be quickly measured at any time by the results. You are either improving in your work or you are slipping. There is no such thing as standing still.

In most industry today we have a very real problem in that both management and labor know that they could do a better job, but both hesitate, fearing the uncertainty of change, and how it might affect them personally.

Supervision Problems

In the feed industry I would sum up our problems in obtaining better results through better supervision in 12 points:

1. Foremen or supervisors do not take time to sell employees. They rely too much on force or authority—army style, straw bossism. A man sold on doing a job voluntarily will do much better than a man simply following orders.

2. Foremen and supervisors spend

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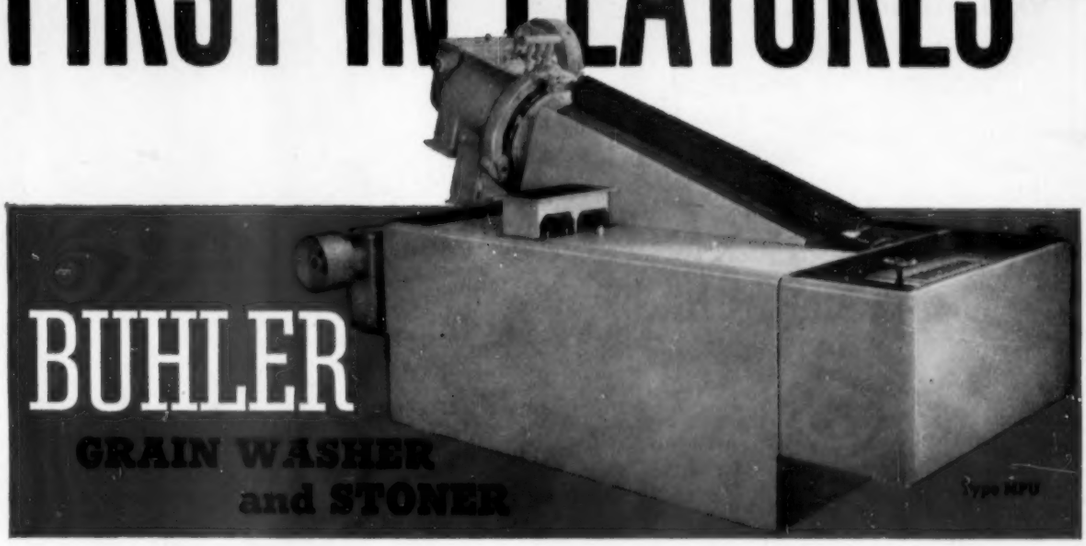

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too much time directing and too little time planning and on follow-up. They need to use more brain power—less hot air.

3. Foremen and supervisors do not make the men feel responsible when things go wrong, nor do they give ample credit when things are well done. If they do this, the men will feel more a part of the organization; they will take a pride in doing a better job.

4. Foremen and supervisors often do not accept their share of responsibility. They seem to want to be middle men between the worker and top management. Are your foremen a definite part of management?

5. Another of our problems is that all too often men do not understand their jobs. They just go through the motions without thought.

6. In many cases neither supervisors nor working men believe that they can improve. This is especially true among older men inclined to think practice makes perfect. Maybe it does, but often it closes the door to new and better ways of doing things.

7. In some cases foremen and supervisors have given up trying to get workers to improve, especially where we have strong unions. Defeatism has set in.

8. Foremen and supervisors tend to accept one experience as policy for future action. One exception and you have made a new rule. Here is where having a complete understanding is important.

9. Foremen and supervisors hesitate to bring problems out into the open. They fear criticism. Human tendency is to cover up.

10. Foremen and supervisors do not know output and the goal towards which they are working. What is expected of them? What is a good job? Do they know their part of your company goal?

11. Foremen and supervisors do not like to face unpleasant situations. The tendency is to be like an ostrich — hide head in sand and try to let unpleasant problems solve themselves.

12. The working man too often does not really know to whom he is responsible or for what he is responsible.

A close relationship between management and employees built on confidence and faith is the result of day-by-day direction with a purpose.

Both management and employees must feel that they are making improvement, that they are really getting somewhere. It is up to management to sell their people on action so that they both believe in the outcome. When this is done, the employee being directed is more inclined to act promptly and quickly. He feels he is part of the organization. He has the "spirit of want to."

Once you have a real **"spirit of want to"** in your organization, in each individual, you will see a willingness to serve a common purpose in day-to-day operations. You will find your men more communicative.

This leads us into the fourth major point in our subject, morale.

Good morale in the working group. A good morale is a spirit in the entire working group that will get results and make for harmonious working conditions.

Good workmanship must be voluntary. Fear of force may cause a man to accept direction, but experience has shown that in most instances it is not accepted in spirit. It is surprising how generally orders or instructions are disobeyed or ignored because they are not really accepted by the men who must carry them out.

Work orders must be understood if they are to be carried out satisfactorily. It must be within the worker's physical and mental power to fully comply with them. It should be in keeping with the worker's personal and selfish interest to comply. He must want to.

In directing personnel, we must consistently think of the person who is going to carry out the order, who is going to do the job, for the follower, not the leader, determines just what and how much work will be done. For results then, the leader must put himself in the worker's shoes.

The leader has two ways of getting people to do things and to accept change: (1) Ask questions — asking

questions makes people think and grow. (2) Telling—when it is necessary to tell people what to do, be sure your thought is positive, not negative. People resent being told what not to do. In some cases they forget the "not" and do just the opposite of what you want.

The leader should remember that he is dealing with human beings who respond to selling and to good treatment. He is concerned with the deep-down feelings of the person or persons involved.

All of us feel and act the way we do in accordance with what we think of a thing or a situation. It is not necessarily the facts in the case that are the determining factor. In many cases the feelings are more important than the facts, in the mind of the person with whom you are dealing. You know how lawyers try to play upon feelings, sometimes almost to the exclusion of facts in trials.

About one tenth of our make-up appears on the surface. Nine-tenths of our make-up is our sub-conscious personality, which is the result of experiences, impressions, fears, etc. These determine our feelings in regard to people, to our jobs, and affect our every day life. A human being is like an iceberg. If we really want to see what a person is we have to look under the surface.

All of us worth our salt have an instinctive aggressive drive in our make-up which is often referred to as spirit. Spirit can show up as a constructive or a destructive thing. The same spirit that was the basis for prejudice, suspicion, and even hate, can be the basis for loyalty and hard work—if it is properly guided.

Full understanding of the job. Our next major point is: Be sure both your supervisors and your men have a full complete picture of the job to be done, an understanding of how you want it done, what the final end to be accomplished is, and if possible, why. They will then feel more pride of accomplishment.

Leadership, not bossism, can accomplish this. Are your foremen, your department heads and your managers leaders, or just bosses? Here are some challenges we made our men, taken from an idea along the same lines in the Progressive Farmer:

A leader develops a pride of accomplishment in his men.

A leader coaches his men—a boss simply drives them.

A leader depends upon good will—a boss uses force.

A leader inspires enthusiasm — a boss inspires fear.

A leader says "we"—a boss says "I".

A leader sets the pace—a boss assigns tasks.

A leader is there ahead of time—a boss says, "You get there on time."

A leader shows how—a boss apparently only knows how so as to criticize.

A leader gives credit when things go right—a boss blames everybody when things go wrong.

A leader should spend a lot of time with his workers, but only to show a real personal interest in the worker and his job; to express appreciation for a job well done; or to make a suggestion for improvement.

Men will follow a leader when they feel that their needs are met in the best way by doing so, and in a better way than by following someone else. This really is just another way of saying that a leader must sell his men on the job to be done and not rely on force or authority.

Men like to be interested in their jobs. When the proper interest is created, a job can become a game and drudgery disappears. Men all like recognition when a job is well done. This seems to have come up several times in this discussion, but it is one of the most important factors in obtaining response from your men.

Men need and want understanding. They want to feel they are a part of what is going on. They need a sense of participation that you can give them by making sure they have a full picture of the job to be done, what, how and why. This sense of

(Continued on page 15a)

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Practical Examinations Seen as Valuable in Testing Operatives

By E. I. SNODGRASS

EDITOR'S NOTE: The author of this article is a member of the milling firm of J. & R. Snodgrass, Glasgow, Scotland. He, in common with other interested Scottish millers, has devoted a lot of time to raising the standard of training among operatives in the milling industry through the granting of a Craftsman's Certificate after a thorough oral and practical examination. The certificate is awarded under the auspices of the Scottish Joint District Council for the Flour Milling Industry. Mr. Snodgrass recently addressed the Merseyside Flour Milling Students' Society on the work that is being done and the article is taken from the report of his talk which was originally published in Milling of Liverpool.

Flour milling is an art and not a science, so a certain number of skilled millers are essential to control the setting of the mill which can never be constant due to variations in the wheat forming the mill grist. This variation is not surprising considering wheat is a living organism and, therefore, so complicated that exact scientific rules cannot be applied. The art and experience of the miller must be relied on together with all the assistance science can give.

It takes years to train a miller and it is necessary to start with youths as soon as they leave school and train them with the fixed purpose of their being future machinemen. Some proof of what has been learned is necessary and so they take written examinations. Yet many good millers have not learned while at school how to express on paper what they know, which results in their failing to pass even in the intermediate grade.

There is nothing new in the idea of a Craftsman's Certificate for the milling industry; but because of the deficiencies of written examinations the value of an oral and practical examination is readily apparent. So far as Scotland is concerned the Craftsman's Certificate examination is only a part of a larger scheme for the recruitment and training of youths. I would like to make it clear that no youths under the training scheme have, as yet, reached the stage of taking the certificate examinations and all my experience, so far, has been with older candidates who must have been in the milling industry for at least five years.

Examination Planning

The planning of a craftsman's examination is by no means easy and the first thing we did was to call together a number of technical directors, mill managers, mill chemists, mill foremen and shift foremen, all of whom later formed the panel of examiners. This body came up with the following decisions:

(1) The examination should cover every job in a flour mill from intake to despatch. As the examination is oral and practical, only those with an all-round practical training could hope to pass, which cuts out the one job man who, by attending milling classes and the necessary study, can pass a written examination, but is not a skilled practical miller.

(2) The tests set for the examination should be stiff enough to make sure that those who pass would be accepted in any mill for any job up to and including rollerman, as far as their technical ability is concerned. This certificate can have nothing to do with their moral character or willingness to work.

(3) The examination is primarily intended for youths under the training scheme towards the end of their period of training, but is also open to other persons with not less than five years' mill experience. The older men would require a period of special training involving all the jobs in a mill from intake to despatch.

(4) To make sure that the proper training had been given, a certificate to that effect is required from a candidate's mill manager before he can be accepted for examination.

(5) The examining panel shall consist of not less than two, and each will assess the candidate's qualifications separately. The final decision of pass or fail shall be decided by the panel after the tests are completed.

(6) An examiner should not be on a panel testing his own men, but

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their mill manager should be interviewed by the panel after the examination to see that a candidate has done justice to this actual knowledge and that he has not received adverse marks due to some difference in the methods used in the candidate's mill from those in the examiners.

No Value in Secrecy

You will see that this arrangement is the only fair one but it involves your competitors' milling experts being shown every detail of your mill before the examination so that they can properly question the candidates. I do not believe there is any value in secrecy in flour milling. If your competitors do gain some new knowledge due to this arrangement, your experts can also gain something when they, in turn, act as examiners in other mills. The final result is a general improvement in milling technique, which is of advantage to the whole industry.

(7) Where possible, a man should be tested in his own mill, but if this is not possible, arrangements will be made to give him a period of training in another mill where he can be so examined.

This is important in the case of a small mill, where it would be difficult for the examiners to test properly the qualifications of a candidate considering that the standard is a skilled miller able to act as rollerman in a mill of any size.

(8) A syllabus for the examination was agreed and a method of marking was worked out. Out of its nine sections failure to pass in any of the first five entails failure to pass the examination as a whole regardless of whether a pass mark is obtained over-all. The reason for this is that these five sections cover the knowledge a man must have before he can be classed as a skilled flour miller. The pass mark is 75% with commendation if over 80% and high commendation over 90%.

(9) The certificate itself is an imposing document worthy of the standard set in the examination.

(10) The examination is timed to last for four hours, including a 15 minute break, and is divided into two parts by a reasonable time for lunch. It therefore takes a whole day for two examiners to test one candidate and a responsible person in the candidate's mill is required to act as a guide and host to the examiners.

(11) The examiners are assisted in their work by the supply of a marks sheet which gives the time allowed for each section or sub-section, the marks allocated to each and space for entering the marks they award. They are also given an "itinerary" which has to be prepared for each mill so that they can cover the ground in the syllabus in an orderly and progressive manner.

Standardization Essential

In putting the scheme into practice, the main problem was standardization to insure that each pair of examiners kept the standard of the questions and of the marking at a constant level. To help this, a trial examination was held at the Chancelot Mill of the Scottish Cooperative Wholesale Society in Edinburgh. The victim was the general manager, William Grant. The examiners were my son and my mill manager, while the rest of the examining panel attended for instruction. Mr. Grant went through the whole examination just as the candidates who followed had to do and gained a well deserved certificate with high commendation.

The next effort was to examine seven men in my mill, and here, the plan was that each day one of the examiners who had done duty the day before dropped out and was replaced by a fresh examiner, thus giving experience to eight examiners who, with the two who carried through the first test, made a total of ten out of twelve available. The result of this series of examinations was that one man passed with high commendation, one with commendation, two with ordinary passes and three failed, showing that the standard of the examination was just about correct.

In the case of a failure, the examiners have to make a report to the directors giving details of the sections of the syllabus where the candidate fell down and of any particular weaknesses. They must also state what period for further training must elapse before the candidate can be re-examined. These particulars are then made available to the candidate's mill manager so that he can concentrate on the elimination of the weaknesses thus revealed.

In all, twenty-four examinations have been held and nineteen certificates granted. In at least two cases, candidates who had failed twice in an intermediate written examination obtained Craftsman's Certificates with high commendation which, I think, proves the value of the Craftsman's Certificate examination.

It is my firm conviction that there is great value in the Craftsman's Certificate examinations, in that those who gain it must have improved their knowledge of the art of milling to the advantage, not only of themselves, but to the mill in which they work.

Buy and Sell Through WANT ADS

Whatever The Source of Heat

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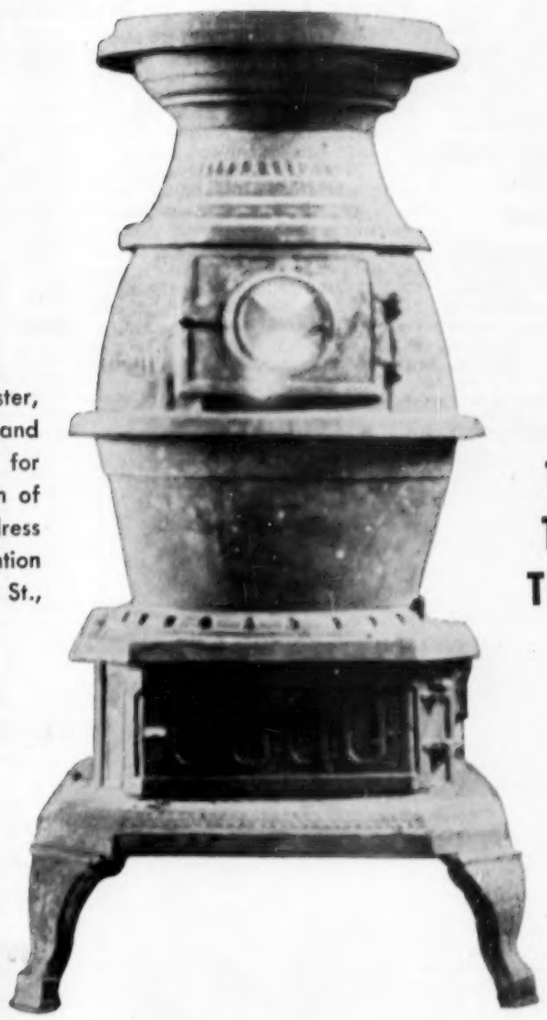


(For copies of this poster, 11 x 17 in., two colors, and bulletin on "Standards for Illustration and Operation of Heating Equipment," address Mill Mutual Fire Prevention Bureau, 400 W. Madison St., Chicago 6, Illinois.)

"TO SAVE THE GRAIN THAT FEEDS THE NATION"

Whatever heats a building could burn it

Worth Looking Into

New Products
New Services
New Literature

This reader service department announces the development of new and improved products, new services and new literature offered by manufacturers and suppliers. Claims made in this department are those of the firm concerned. Use the accompanying coupon to obtain the desired information.

No. 5353—Fire Alarm System

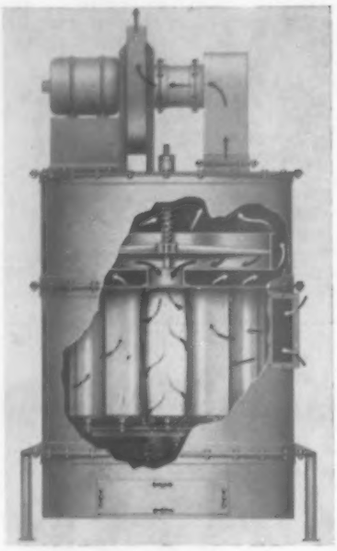
The Seedburo Equipment Co. announces a new fire alarm system which is recognized by the Mill Mutual Fire Prevention Bureau. The system, called by the trade name, the Secoalarm, utilizes a sensitive thermostat and is designed principally for elevator legs and cupola protection in country elevators and feed and seed houses. The unit can be installed by any competent electrician or by any good mechanic if a competent electrician is not available, unless local ordinances or codes require otherwise, the company states. It has an audibility range of approximately one quarter mile. Additional information may be obtained by checking No. 5353 on the coupon.

No. 5321—Catalog

The Chantland Manufacturing Co. has available a new catalog describing its conveyors and allied products. The catalog includes a complete price list, fact sheets as well as numerous illustrations and product descriptions. The company's conveyors, called the Elton line, are available for handling a wide variety of materials in sacks, bales, boxes and in bulk. Conventional conveyors, as well as wheel and roller units in straight and curved models are described in the catalog. Secure the catalog without charge by checking No. 5321 on the coupon and mailing it to this publication.

No. 5367—Dust Filter Unit

A new unit dust filter which makes possible an automatic continuous filter has been announced by the Day Co. Known as the Day "type RJ" dust filter, it is the latest addition to the firm's line of reverse jet dust filters. It handles air volumes up to 1,200 CFM. The company announcement states that the "filter lends itself well to all continuous process equipment because no shut down is needed for rapping or cleaning. Cleaning and discharge of material is handled automatically and continuously. Major reason given for the high efficiency (99.99+%) of this new filter is the fact that it employs the Hersey principle of high velocity reverse air



cleaning. The filter differs from the usual Hersey principle in that the dust is deposited on the outside of the filter sleeves. In all there are 12 filter sleeves employed in the unit and the filter media used is of a felted material. The reverse air for cleaning the filter sleeve surges from an indexing drum through each sleeve individually. For longer, maintenance free life, all moving parts in the filter are located on the clean air side of the filter media. The entire unit is shipped assembled and the only installation required is the piping and electrical connections." Secure more complete details by checking No. 5367 on the coupon and mailing it to this publication.

No. 5368—Pulverizer Bulletin

The Pulva Corp. announces the availability of a new condensed bulletin No. 5510 describing the firm's line of high speed pulverizers. This firm's product, called by the trade name Pulva-Sizer, is available in five sizes ranging from ¾ h.p. to 75 h.p. The bulletin states that there is "a size and type to meet your requirements . . . for fine grinding, blending, and dispersing, granulating, wet milling or close particle size control." A partial list of companies who are users of Pulva equipment is included. Secure the brochure by checking No. 5368 on the coupon and mailing it to this publication.

No. 5371—Bag Filling Machine

A new brochure on Kraft Bag Corporation's automatic open mouth bag filling machine, called by the trade name, Kraftpacker, has been prepared. The brochure is entitled, "What You Want to Know About the Kraft Bag Corp. Automatic Open Mouth Bag Filling Machine." Two pages of the brochure are devoted to a question and answer method of presenting information. The brochure states that the unit will handle all weights from 25 lb. to 200 lb. The back page is devoted to a diagram and text explaining how the machine works. Secure the brochure by checking No. 5371 on the coupon and mailing it to this publication.

No. 5359—Drag Conveyor

The Southern Equipment Co. has on the market a product called by the trade name, Seco conveyor, said to be a fully automatic drag conveyor. Sold in conjunction with the Seco hammer mill, the conveyor is described as stopping automatically when the mill begins to load and starting automatically as the load eases. The unit will convey any feed in any amount, it is claimed, and is built of steel with a variable-speed motor and shielded double chain drag. Round adjustable ends, double bottom and baffle plate prevent waste, it is said. Sizes range from 12 to 36 in. in width. Secure more details by checking No. 5359 on the coupon.

No. 5346—Straddle Carrier

A straddle carrier with load hooks which pivot inward to permit carrying without bolsters has been introduced by the Ross Carrier Division of Clark Equipment Co. In place of the conventional rigid load hooks, the new carrier has four forks, two on each side, which swing in at right angles and meet in the center to form two arms under the load. Pivoting movement is controlled by hydraulic cylinders actuated by a lever on the left side of the driver's seat. A second lever hydraulically controls the vertical movement of the hooks. Secure more complete details by checking No. 5346 on the coupon and mailing it to this publication.

No. 5344—Bulletin

An eight-page, two-color bulletin describing equipment it is now manufacturing for the process industries is available from the Fuller Co., a subsidiary of the General American Transportation Corp. Twenty photographs and eight schematic drawings illustrate the various conveying systems, rotary compressors and vacuum pumps, inclined grate cooler and preheater. Conveying systems are shown in typical operations. Compressors, pumps, coolers and preheaters are also shown in action, and tables supply complete information on performance and capacity. To secure the bulletin check No. 5344 on the coupon and mail it to this publication.

Send me information on the items marked:

☐ No. 5321—Catalog	☐ No. 5359—Drag Conveyor
☐ No. 5344—Bulletin	☐ No. 5367—Dust Filter Unit
☐ No. 5346—Straddle Carrier	☐ No. 5368—Pulverizer Bulletin
☐ No. 5353—Alarm System	☐ No. 5371—Bag Filling Machine

Others (list numbers) .....

NAME .....

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POSTAGE WILL BE PAID BY—

The Northwestern Miller

P. O. Box 67,

Reader Service Dept. Minneapolis 1, Minn.

First Choice Wherever Grain is Handled

Your jobber has them, or write B. I. Weller Company, 327 South LaSalle Street, Chicago 4, Illinois.

(1) The logarithmic curve design loads easier . . . dumps cleaner . . . permits high speeds.
(2) Scientifically formed lip aids in greater cup capacity.
(3) Bolt-hole placement gives better cup balance . . . saves belting.
(4) Hyperbolic sideboard ends permit greater load capacity without "slopping."

CALUMET CUPS

MANPOWER

(Continued from page 9a)

participation can come through asking them, consulting them about policies, or action to be taken before it is announced, by taking them into your confidence. This is particularly true of your key men.

Our co-workers are not much different from our children or our friends. They largely become what we expect them to be. People feel good when others expect a lot of them.

One of the big things that helps in day-by-day directing is to have a goal—a goal set ahead of time so that everyone knows where he is going, what the master plan is. This makes day by day orders fit in with the aim or goal that everyone is working towards.

It isn't easy to sell a goal or a goal program. It takes constant repetition. It takes interest; it takes thought; it takes thorough planning. Men need to be sold on the fact that in reaching certin objectives they will benefit as well as the company. In fact, they must know and understand that success for the employee is essential for success of the company, and vice versa.

One of the basic problems in directing personnel is one of communication. When we talk about communication, we need to remember that the same things often mean different things to different people. Our choice of words is important. We should think ahead carefully to be sure we use words the other fellow understands.

We need to remember that a good part of our communication is to sell someone on action, which in a sense means we must mold their attitude. Nothing is accomplished if we do not sell the person we are directing on doing it right. We are better off to make three or four contacts thoroughly than to make a dozen or more hurriedly. Some hurried contacts are worse than none at all.

In most contacts we are trying to put over a new idea insofar as the worker, the man we are talking to, is concerned. His mind goes through several steps in accepting the idea, any new idea. His first reaction is to challenge it. We all fight change. His second reaction, if properly handled, is to think about it, and he will finally come to the conclusion that the idea is not really new. Finally he will think that he has always known the basic idea, and feels he is sharing it with you. When this is accomplished, your basic idea is sold.

Of equal importance, in our company anyway, is the problem of delegation. The big problem in delegation is the time it takes to develop a person who can and will handle problems for you in about the way you would do it yourself. This is not necessarily too difficult if your training program for supervisors teaches your policies so that your people will know how you basically want to operate, so that they can have the same "highway of decision" that you have.

Every time you make a decision, explain how you arrived at it. Explain why the decision is best for the company. The person you are training will then soon know how you think. Ask your people how they would handle a situation, talk it over with them before going out to put an order into effect. In this way you get some counseling in ahead of time.

Delegation of responsibility and authority. Delegation, another major point in this discussion, is often misunderstood. You never can really delegate responsibility because you can never cease being responsible yourself. You can delegate authority, but you cannot fully delegate the responsibility.

The big problem is to delegate authority for action, and still keep yourself informed. Tell your people you want to know the outcome of certain actions. A really good supervisor should keep you posted. Be available for your people to tell you about things. The quickest way to kill good communications is to be too busy to listen.

Make a special point of asking about results or progress at each opportunity, being careful not to give the impression that you are simply "checking up." Your interest must be genuine; otherwise your men will feel that you are "breathing down their necks" so to speak, that you do not really trust them. Your follow-up should indicate interest and inspire confidence, not distrust.

You must develop self confidence in your men, especially your key people. An atmosphere of approval from the top encourages people to want to assume more responsibility. Let your people know that you have confidence in them. You should have confidence in them, if you plan to entrust supervisory responsibility and authority to them.

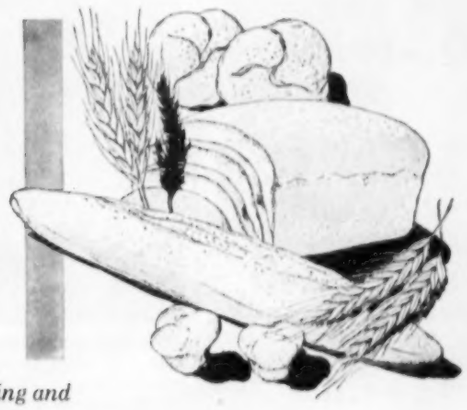
Getting results is at all times a slow and painful process. Leadership has to have the right motive. We can call this a square deal, or just fair mindedness. What is to be done should be thought out carefully, then be carried out with enthusiasm.

One of the most difficult things to do in effective personnel direction is to take an "old school" type management man and make him realize that there is more to giving direction than just giving orders.

"I'll go along with this leadership stuff, but the first man that doesn't

(Continued on page 17a)

FLOUR FOR MAN'S BREAD*



A Brief History of Milling and Baking by SCIENCE WRITER

CHAPTER XI. *Milling Begins Moving Westward*

FROM FOREST TO FARM

The land was there to the west, waiting to be used. Thousands of square miles beyond the Alleghenies were forest covered. As the population pushed westward in the early 1800s, along forest trails and corduroy roads, settlements came into being chiefly beside waterpower sites.

Small grist mills came into operation at these small centres near the streams and falls to serve the settlers who cleared the land and then farmed it.

As the rich land increased its bounty, settlements soon grew in size, and so did the mills. Not only grist but saw and woolen mills were constructed to serve the areas.

These self-sufficient small settlements were practically isolated until better roads reached them. There is an instance in Indiana of a thriving small center which was so remote that almost half of the Nineteenth Century had passed before it had more than a semi-annual contact by wagon train with the nearest major trading center, Cincinnati.

CANALS, RAILROADS, TURNPIKES

The pioneering farmers began to use the immense fertility of the Mid West. The need for grain to feed the crowded eastern U. S. and for export existed. But better ways to get the grain to market were needed.

Water transport was the first answer. By canal, river and lake the grain traveled east to the seaboard. Not long after the canals were well established, the railroads were built into a great network which reached the Pacific. Better roads and turnpikes, too, were made. The great, rich plains of the states in the western part of the Mississippi's basin added their prodigious output of grain to the supply.

A FLOOD OF GRAIN

As the land filled with settlers a flood of products poured to the Atlantic: the grains, wheat and corn; cattle; coal and ores. The earlier isolated communities tended to disappear. Rural areas were more closely linked with urban centers. New patterns of living emerged and new methods of large scale production were created to meet the new conditions. We shall tell about this development as it affects milling in our next chapter.

BETTER WHITE FLOUR AND BREAD FOR BETTER HEALTH

This is a fact: Americans want fine, *white* flour and bread. To get it millers have to mill out portions of the grain carrying valuable vitamins. But then they restore the most important of these, without sacrificing whiteness, by "enriching" with pure vitamins B_1, B_2, niacin and iron. Result: white flour of highest nutritional value, better health for millions of people.

This is one of a series of articles which is being published in professional nutrition and dietetic journals, and which will be widely distributed for educational purposes. Reprints of this and all previous chapters are available without charge. Write to the Vitamin Division, Hoffmann-La Roche Inc., Nutley 10, New Jersey. In Canada: Hoffmann-La Roche Ltd., 286 St. Paul Street, West: Montreal, Quebec.

*This is the title of a definitive history of milling by John Storck and Walter Dorwin Teague, published by the University of Minnesota Press at Minneapolis and copyrighted by the University of Minnesota. It is used with permission as a source of material for this series of advertisements.

Enriched with vitamins and iron for better nutrition

- MAXIMUM RESULTS
- GREATER SAFETY
- MORE ECONOMY

Bromotox, a mixture of ethylene dibromide and methyl bromide, is an effective, safe and economical space fumigant. The stronger odor and lower dosage requirements of Bromotox result in greater killing power, increased economy and maximum safety. It is longer lasting, more penetrating and leaves no residual odor. Bromotox allows positive control of granary and rice weevils, Angoumois grain moth, confused flour beetle, Mediterranean flour moth, raisin moth, cheese mites and many other pests infesting grain, flour, rice, cheese and dried fruits. Available in cans packed twelve per case as well as 10, 50, 120 and 170 pound cylinders.

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STREAMLINER—The modernistic appearance of the new semolina plant of Molino Fredella at Foggia, Italy is illustrated in this picture. It is typical of the design of many mills in Europe today and the outside is matched by an equally streamlined interior.

Streamlined Mills Fashionable Among European Millers

Modern mills have modern lines. In Europe several new plants have been erected in recent years and, inside and out, they present a streamlined appearance. In North America, on the other hand, there is little opportunity for outward modernity for new plants have to go into old buildings.

Typical of the modernistic trend is the semolina plant of Molino Fredella at Foggia, Italy, which was built by the German engineering firm of MIAG, Brunswick. The mill is equipped with the latest pneumatic cleaning system as well as with facilities for the pneumatic conveying of mill stock. Following a short period of operation a substantial increase of capacity, with the consequent enlargement of the mill, was found necessary. The architect accomplished this without destroying the stream-lined conception of the original building.

The over-all layout, the sanitation features and the up-to-the-minute machinery are drawing many prominent visitors, including members of the government. One recent visitor was Dr. Henry J. Tasca, director of the U.S. mission to Italy.

MIAG has been responsible for other new mills in Italy, including Molino Pugliesi at Bari, a semolina mill, and the Molino Lario at Como, a wheat flour mill.

VISITORS—Dr. Henry J. Tasca, director of the U.S. mission to Italy, inspects the interior of Molino Fredella in company with one of the owners, Dr. Guiseppi Fredella.

INTERIOR—The inside of the Molino Fredella is as streamlined as the outside, an achievement resulting from the application of the pneumatic system to the milling operation.

DAWSON 73
The
LOW-DOSAGE
Spot Fumigant

NOW IN 1-SHOT CANS

JUST **Punch and Pour** in same fumigation ports now used: Discard can and move to next point. Dawson 73 in two-inch shot can carries knock-out strength of about a quart of conventional fumigant. No more pouring from shipping containers to applicator bottles . . . no wasted time . . . no fumigant lost . . . no broken glass. Your costs will be much less. Prove it to yourself. Order case of 48 cans Dawson 73 today.

The "LITTLE SQUIRT"
for MAXIMUM MILL EFFICIENCY

There's nothing like the "Little Squirt" applicator and Dawson 73 if you have a large mill. Used in many leading mills. Cuts costs substantially. Two men can fumigate average mill in two hours. No equipment to buy. No initial investment.

DAWSON'S FORMULA 73 Specially prepared for Spot Fumigation In Mills, Bakeries, Breweries, Etc.

DAWSON LOW-DOSAGE FUMIGANTS

FERGUSON FUMIGANTS

810 S. Florissant Rd.,
FERGUSON 21, MISSOURI
In Canada: Kipp Kelly, Ltd., Winnipeg and Toronto

MANPOWER

(Continued from page 15a)

follow me is going to catch hell!"

Incentives for good work. For years most employers believed that the chief incentive for work was the pay check. Surveys indicate that the pay check is by no means the most important source of satisfaction to most employees.

The order of importance of incentives to work will vary somewhat from one business to another, but enough surveys have been made to enable us to list the things that are most important to employees.

Many thousands of workers, in numerous industries, listed work incentives in this order:

1. Security—steady work—not having to worry about tomorrow. That is the basis of "guaranteed annual wage," SSA unemployment insurance, etc.
2. Good working conditions, pleasant surroundings.
3. Congenial working companions.
4. A fair boss—a friendly atmosphere gives credit where credit is due.
5. Opportunities for advancement.
6. Good pay.
7. A chance to use their own ideas.
8. An opportunity to learn new work.
9. Good hours.
10. Last of all—easy work.

The measure of your success in manpower management is in the "spirit of want to" you find in your men. Personnel direction in such a manner that this spirit is developed will put any industry in the successful business class.

It is what you do and how you do it that counts. The workers need leaders who have the know-how.

RADIATION

(Continued from page 1a)

by Radiation Applications, Inc., has started a systematic attack on the various problems in order to convert the research results into practicable industrial operations. The problems include: (1) the effects of handling during and after irradiation process, (2) the cost and availability of adequate radiation sources, (3) the determination of the optimum point of application between the farmer and the consumer, (4) the development of equipment to do the job, (5) the marketing and distribution of equipment and services, (6) the attitude of the Food and Drug Administration and (7) public acceptance of the product.

The experimental data on radiation processing of food were usually obtained under controlled laboratory conditions. No work was done on how the irradiated products were affected by subsequent handling, packaging, shipping or by the manner in which they were stored and sold. Some of these effects, for example the bruising of potatoes, are potentially important. Experiments under common commercial conditions are now planned.

Work is proceeding in connection with the comparative cost studies of isotope, fission product and machine sources. Developments in the fusion field are under surveillance since the displacement of fission reactors by fusion reactors may drastically affect the future supply of radioactive sources. Also, the overall federal policy toward isotope production and distribution is under discussion with the AEC.

Point of Application

The optimum point of application is another subject of careful analysis. In the grain industry, radiation may be applied at any point from the harvester to the terminal processor. Due to the speed with which infestation damage occurs, it would appear at first glance that the most good can be done by irradiation at harvest. However, the lots to be treated are uneconomically small and the local conditions are conductive to re-infestation. Consequently, the terminal elevator is probably the best point for treatment.

In the case of potatoes, selection of the point of radiation application is not critical. Sprouting does not proceed as rapidly as insect infestation in grain. Also, once subjected to radiation, potatoes do not regain their ability to germinate and sprout. Consequently, a mobile field irradiator traveling from farm to farm with the harvest equipment may prove as feasible as a central radiation facility at a main storage point.

The lack of specific food and drug standards regarding the acceptability of irradiated foods has been a major obstacle. This situation is partially responsible for the public controversy regarding the acceptability of irradiated foods. On the other hand, the failure of the responsible agencies to give this matter immediate and realistic appraisal is at least partially due to pressure from several segments of the public. All in all, the Food and Drug Administration faces a thankless task, but face it, it must! A protocol for the clearance of irradiated foods must be established. The clearance procedure must be scientifically sound so as to enjoy the confidence of the professional man and the layman. In addition, after the first few radiation processes have cleared, radiation processing as such should no longer be handicapped. That is, FDA should be no more stringent toward a new radiation process than toward a new chemical food processing method.

Even if all these problems are solved, there is always customer acceptance to be reckoned with. This is a problem which we can at present only guess at. My personal opinion is that a well-educated public will not prove unreasonable in the face of overwhelming scientific evidence, especially when the net effect to society is so beneficial.

As for the food processor, he has proved to be well aware of the developments and has been very cooperative in assisting them further. He also will probably yield to the new techniques once they prove themselves to be technically and economically sound.

In spite of the problems, no obstacle I have listed, be it scientific, nutritional, toxicological, economic, technological or governmental, is insuperable; and for many of them the solution is in sight. Indeed, the future for both irradiated grains and potatoes looks good. I am convinced that pilot plant irradiators will be in operation within two years. Processing on a commercial scale is probably five years off.

In summary:

1. Practical permanent preservation for civilian markets by radiation is not very promising. However, meat may be a major exception.
2. Permanent preservation of food by radiation for the military establishment may be feasible.
3. Low dose applications for limited increase in storage life are very promising. Grain and potatoes probably will be the first radiation processed foods to be marketed.

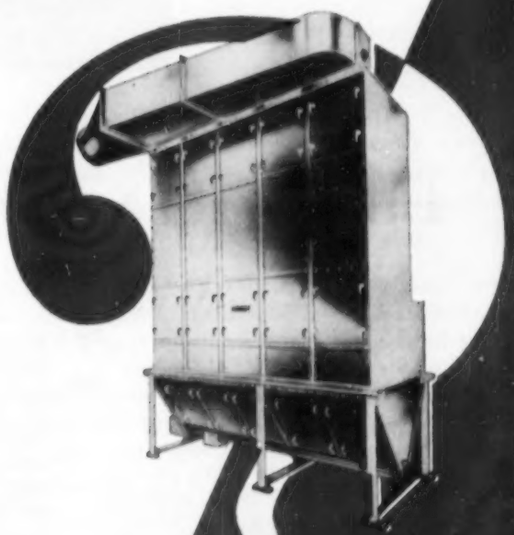
One final note of caution—radiation processing is not the only technique to come on the horizon in recent years. The use of antibiotics, dehydrofreezing and new methods of canning have been proposed. These may prove very effective competition against most of the high dose applications, and some of the low dose ones, also.

The FDA has just cleared the antibiotic treatment of eviscerated poultry; this should increase the shelf-life from seven to 14 days. Several other similar applications are in the offing.

"DO-IT-YOURSELF" or "TURN-KEY" job ? ? ?

an ENTOLETER DIVISION designed system solves dust collection problems either way . . .

Our engineering staff will specify the Simon Suction Filter Dust Collector to meet your mill requirements . . . ship you the parts and installation instructions and you can "DO-IT-YOURSELF"! All parts are jig-drilled and tapped to facilitate assembly . . . or dismantling should future requirements dictate its relocation.



OR. . .

Our engineering staff will design a "turn-key" dust collecting system incorporating a Simon Suction Filter Dust Collector, tailored to your specific requirements . . . contract and supervise its complete installation . . . relieving you of all details until it's time to pull the "ON" switch.

Regardless of which method solves your dust collecting problem . . . the all aluminum SIMON SUCTION FILTER DUST COLLECTOR is the answer. It has been redesigned and streamlined to keep in step with modern milling practices . . . contains the greatest filtering area per square foot of floor space . . . operates with high air to cloth ratios . . . uniform air flow . . . low power requirements . . . IT IS YOUR BEST BUY IN DUST COLLECTING EQUIPMENT!

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Designers and Engineers for Mills, Elevators and Feed Mills
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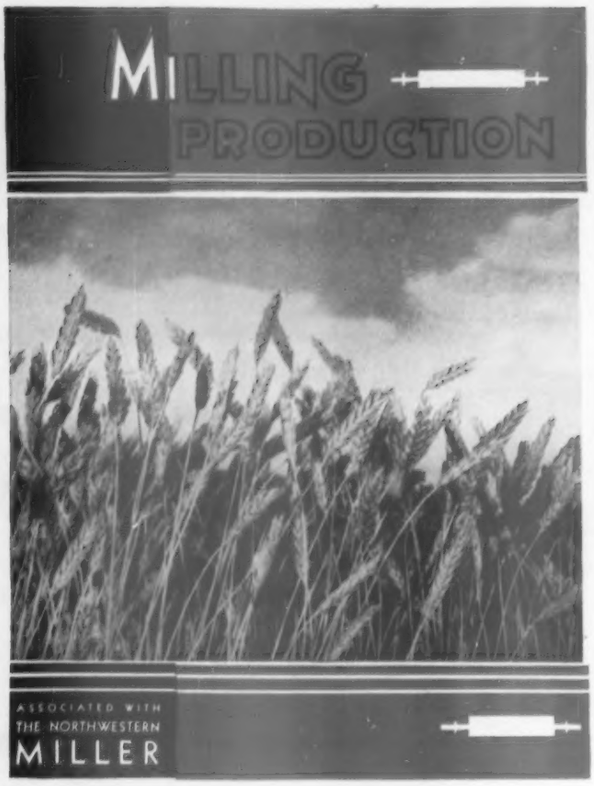

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1. WORKING CIRCULATION—Studies of flour manufacture show that about 300 of the mills in this country produce 98% of the flour. Milling Production with its controlled circulation reaches more than 1,000 key men in these important flour mills. This working circulation provides contact each month with the people who directly or indirectly control the buying—superintendents, operative millers, chemists and plant managers. *There is no waste circulation—only working circulation*—and you are assured of reaching your potential customers in the most productive mills.

2. LEADERSHIP MAKES READERSHIP — Readership surveys and unsolicited correspondence from its readers attest to the editorial leadership of Milling Production. That editorial leadership is held by complete words-and-pictures reports of the latest milling technology, current news, features and complete coverage of the activities of the industry's two technical associations. *The real price the reader of a publication pays is the amount of time he puts in reading that journal.* Over one half of the readers of Milling Production have requested that it be sent to their homes so that they may enjoy uninterrupted reading pleasure.

3. DOUBLE-DUTY DOLLARS—Money spent for advertising in Milling Production does double duty. In addition to reaching the production personnel, the advertiser's message is read in the Milling Production Section of The Northwestern Miller by the executives who approve purchase orders. *No other advertising medium in the flour milling industry offers this double-duty feature of reaching both groups*—mill technologists and executives—with the same advertising message and for the cost of one advertisement. Take advantage of this 100% coverage through one double-duty advertising contract.

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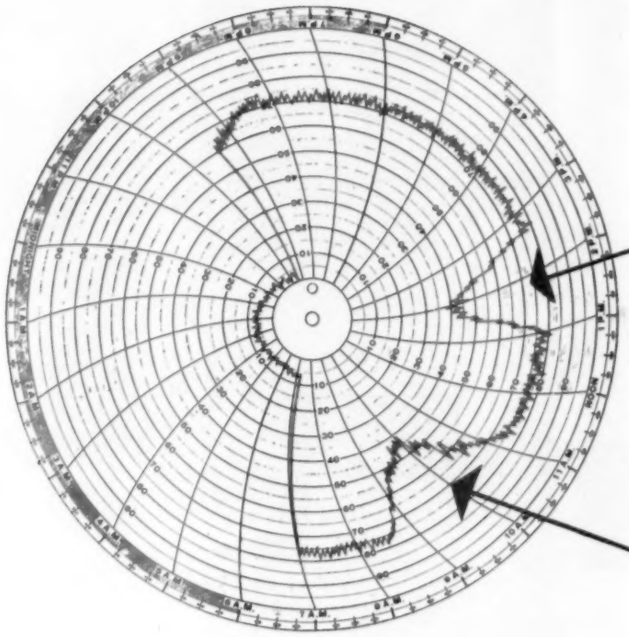

these mean trouble...

IT MIGHT BE a broken belt, a torn sieve, or a choke-up somewhere in the spouting.

But... no matter *what* causes the flow variation in the flour stream ... it's spotted the INSTANT it happens. One look at the graphic recorder operated from the W&T Massometer or Merchen Scale Meter tells the story. Even the smallest momentary fluctuations in flow rate are detected immediately and recorded accurately by these mill "watch dogs."

W&T Massometers and Merchen Scale Meters provide a continuous record – *by weight* – of actual mill performance. They tell you the *exact* flow rate of your streams and they pinpoint time and production losses.

Guaranteed to 1% accuracy, the Massometer will handle flour flows up to 200 pounds per minute... the Merchen Scale Meter, up to 600 pounds per minute. For other applications the Meter will handle flows up to 3000 pounds per minute. Both instruments have been tested and proved highly dependable in hundreds of installations throughout the country.

For complete information, write us today or communicate with your nearest W&T representative.

Massometer

Merchen Scale Meter

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